

REPUBLIC OF UZBEKISTAN
MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATIONS
CHIRCHIK STATE PEDAGOGICAL UNIVERSITY



“MODERN BIOLOGY EDUCATION AND INTERNATIONAL TEACHER
TRAINING” SCIENCE’S WORKING CURRICULUM (SYLLABUS)

Daytime 4 course

Field of knowledge: 100 000 – Education
Field of study: 110 000 – Education
Course of Study: 60110900 –Biology

№	Type of training	Type of training	Semester	
			8	Allocated credit
1	Lecture	30	30	4
2	Laboratory	30	30	
3	Course work	-	-	
4	Independent education	60	60	
5	Total audience hours	60	60	
6	General hours	120	120	

CHIRCHIQ- 2024

The curriculum (syllabus) of Chirchik State Pedagogical University, Faculty of Natural Sciences, "Biology" Department, was reviewed and recommended for approval at the meeting numbered 1 on "29" 08, 2024.

Developer:

To'ychiyev J.I Teacher of the "Biology" department of CHDPU

Reviewers:

Professor of the Department of "Zoology and Anatomy" TDPU named after Nizomi, doctor of biological sciences
Shaxmurova G.A

ChDPU "Biology" department, etc. associate professor
Safarov I.V

The curriculum (syllabus) was discussed at the 1th meeting of the Council of the Faculty of Natural Sciences of Chirchik State Pedagogical University on 28 08, 2024.

Dean of the faculty:

[Signature] d.p.s., prof. Raximov A.K

The curriculum (syllabus) of Chirchik State Pedagogical University, Faculty of Natural Sciences, "Biology" Department, was reviewed and recommended for approval at the meeting numbered 1 on "28" 08, 2024.

Head of the department:

[Signature] d.b.s., prof. Fayziyev.V.B

Science code:	Year	Semester	Amount of credit:
Type of subject: Elective subject	2024-2025	8	4
	Science language: English		
	Subject title	Auditory training	Independent education
1	Modern biology education and international teacher training	60	60
			Total
			120

1.Summary of science

"Modern biological education and international teacher training" subject involves teaching biology using modern methods and training teachers according to international standards. This subject provides students with biological knowledge using modern pedagogical technologies, interactive methods and advanced focuses on learning with the help of educational tools. There is also an emphasis on the development of theoretical and practical skills in the preparation of highly qualified biology teachers who meet international educational standards.

The content of the subject covers the following main directions:

Main directions of modern biological education: new approaches, technologies and tools in teaching biology.

International education standards: international biology programs (eg Cambridge IGCSE, A-Level, IB) and their corresponding teaching methods.

Interactive methods in teaching students: experiments, research projects, project-based learning and digital tools in the study of biology.

International Teacher Training: Internationally Certified Teacher Training Programs and Practices.

Pedagogical and Didactic Skills: This subject allows teachers to teach biology to students in the most effective and interesting ways, as well as to develop the necessary skills to become an internationally competitive teacher.

2. Learning outcomes:

Students who completed the course:

- Students know and can use modern teaching methods, digital technologies and advanced pedagogical approaches. This allows them to teach biology to students in an effective and interesting way;
- Students acquire skills in teaching biology using experiments, project-based learning, digital tools, and interactive activities;
- Students acquire knowledge of international programs such as Cambridge IGCSE, A-Level, IB and develop the ability to develop and teach educational materials suitable for these programs;
- Become competent in teaching biology using digital tools. They can use simulations, educational platforms and other modern learning tools.

Competencies to be acquired as a result of the course:

- to have in-depth knowledge of the basic concepts and theories of modern biological science and their practical application. Ability to understand and develop relevant materials for international biology programs such as Cambridge IGCSE, A-Level, IB. Ability to effectively use pedagogical and didactic methods used in teaching modern biology (KK-1);
- participates in the implementation of scientific-research works (KK-4).

3. Science content: lecture

№	Training topics	Size of lesson hours
VIII- semester		
1	Cell division and nucleic acids	2
2	Chromosomes, genes, proteins	2
3	Movable tissues.	2
4	Intracellular and extracellular transport	2
5	Principles of the body	2
6	Enzymes and its mechanism.	2
7	Energy and gas exchange	2
8	Photosynthesis	2
Current control		
9	Effect of external factors on the body	2
10	Immunity and poisoning	2
11	Interaction of ecology and anthropogenic factor	2
12	Metabolism of substances and energy	2
13	"International Assessment"	2

14	"Principles of using command words in international evaluation"	2
15	Comparative analysis of teaching processes in Uzbekistan and developed countries	2
Total:		30

Lectures are taught to academic groups in an auditorium equipped with multimedia devices using interactive methods, "Case study", "Blitz survey", "Why" based on innovative pedagogical technologies.

4. Laboratory training

№	Training topics	Size of lesson hours
VIII- semester		
1	Mechanism of intercellular transport. Permeability in the cytoplasmic membrane	2
2	Determination of threshold strength in neuromuscular preparations. Relative fatigue of nerve fibers. Study of the state of parabiosis	2
3	PCR reactions and their application procedure. Cell structural components. Cytomorphological signs of cell cycle, apoptosis, necrosis, inflammation	2
4	Structure of chromosomes, complex of genes. Modern diagnosis of chromosomes and genes	2
5	The phenomenon of homeostasis and adaptation in the organism. The mechanism of implementation of the functional system	2
6	Mutations in enzymes and their biological role. Catalytic mechanism of enzymes	2
7	Measurement of respiration and respiration coefficient. Stages of energy exchange.	2
8	Determining the quantitative analysis of pigments. Determining the quantitative and qualitative analysis of light and dark phase substances	2
Current control		
10	Preparation of histological preparation. Integration of organism with antibiotic and vaccine	2
11	Antigen response of the organism. Poisoning of the organism and its prevention measures.	2
12	The effect of chemical substances on the body. To find out the secret of modern ecology and green economy, to learn how to	2

	measure the patient's pulse and blood pressure.	
13	Obesity, GMO products. Creating a diet	2
	Assessments in different international education systems and their differences. Use of assessment methods and their impact on students.	2
	Analysis of command words and their use. Determining the size of types.	2
	Preparation for lessons and use of modern platforms (Problem-based learning)	2
	Total:	30

The module is organized through lectures and practical classroom training, as well as independent educational activities of students. Lectures provide theoretical information necessary for analyzing the topics of Modern Biology Education and the International Teacher Training Course. In practical classroom sessions, problems (examples and problems) of Modern Biology Education and International Teacher Training Course are presented and students are given the opportunity to practice the application of physiological methods and techniques necessary to solve them. In independent educational activities, students should study the topics in depth and analyze the topics using literature and scientific journals and sources. Students discuss the topic in small groups, thereby creating an opportunity to further consolidate knowledge and deepen understanding. Students work on problems aimed at identifying, analyzing and finding solutions to real-life biological problems.

5. Independent education

№	Subjects of independent education	Size of lesson hours
1.	Structure of chromosomes, set of genes.	2
2.	Modern diagnosis of chromosomes and genes	2
3.	PCR reactions and their application procedure .	2
4.	Cell structural components. Cytomorphological signs of cell cycle, apoptosis, necrosis, inflammation.	2
5.	Determining the threshold strength in a neuromuscular preparation. Relative fatigue of nerve fibers.	2
6.	Study of parabiogenesis	2
7.	Intercellular transport mechanism.	2
8.	Permeability in the cytoplasmic membrane	2
9.	The phenomenon of gameostasis and adaptation in the	2

	organism .	
10.	Functional system implementation mechanism .	2
11	Mutations in enzymes and their biological role .	2
12	Catalytic mechanism of enzymes .	2
13	Measurement of breathing and respiratory rate.	2
14	Stages of energy exchange.	2
15	. Determination of quantitative analysis of pigments	2
16	Determine the quantity and quality analysis of substances in the light and dark phase.	2
17	Preparation of histological preparation	2
18	Integration of the body with antibiotics and vaccines	2
19	The body's response to an antigen.	2
20	Poisoning of the organism and its prevention measures.	2
21	Effects of chemicals on the body.	2
22	Modern ecology and green economy	2
23	Obesity, GMO products	2
24	Establishing a food ration	2
25	Assessments in different international education systems and their differences	2
26	Use of assessment methods and their impact on students	2
27	Analysis of command words and their use	2
28	Determining the size of species	2
29	Preparation for class and use of modern platforms	2
30	Problem-based learning	2
	Total:	60

Additional literature

1. Cambridge International AS and A Level Biology Coursebook" by Mary Jones and Richard Fosbery Print/online bundle. April 2020
2. Cambridge International AS & A Level Biology Coursebook with Digital Access (2 Years) 5ed. Cambridge AS and A Level Author(s): Mary Jones, Richard Fosbery, Dennis Taylor, Jennifer Gregory Print/online bundle. April 2020

Sources of information:

- <http://www.aids.ru/>
<http://medbiol.ru/>
<http://www.who.int/ru/>
<http://immunologia.ru/>
<http://www.immunoanaliz.ru/>
<http://immunology.agava.ru/>
<http://immuno.health-ua.com/>
<http://www.cspu.uz>
<http://www.cabridge.org>
<http://zivonet>
<http://Medika.ru>
<http://mendeley>

6. Requirements for obtaining loans:

Full mastery of theoretical and methodological concepts related to science, accurate reflection of analysis results, independent observation of the studied processes and completion of tasks and assignments given in the current, intermediate control forms, written work on final control submit.

7. Criteria for evaluating and controlling students' knowledge of science

Approved by the order of the Minister of Higher and Secondary Special Education of the Republic of Uzbekistan dated August 9, 2018 No. 19-2018, registered with the Ministry of Justice of the Republic of Uzbekistan No. 3069 dated September 26, 2018 was developed in accordance with the regulation "On the control and evaluation system of students' knowledge in higher education institutions".

1	2
Evaluation methods	Written works, oral examination, exhibitions
Evaluation criteria	5- "excellent" - conclusion and decision-making; - ability to think creatively; - ability to observe; - being able to apply the acquired knowledge in practice; - understanding the essence; - to know, to tell; - have an imagination 4- "good" - ability to observe; - being able to apply the acquired knowledge in practice; - understanding the essence; - to know, to tell; - have an imagination. 3- "satisfactory" - understanding the essence; - to know, to tell; - have an imagination. 2- "unsatisfied" - not having a clear idea, not knowing.

Basic literature

1. "Modern biology" Author(s): Hold, Rinehard and Winston.
2. Cambridge IGCSE Biology Coursebook" Author(s): Mary Jones and Geoff Jones. 2012 year. p 460